



Catalogue for International Students

School of Industrial and ICT Engineering

Public University of Navarre

Pamplona Campus
Tudela Campus

April 2022

Catalogue for International Students

Content

Courses Taught in English	3
Bachelor's Degrees in Mechanical, Electrical and Industrial Engineering.....	3
Bachelor's in Degree Design Engineering (Tudela Campus)	3
Bachelor's Degree in Telecommunications Engineering.....	4
Bachelor's Degree in Computer Science	4
Master's Degree in Industrial Engineering.....	5
Online Courses	5
English Friendly Courses	6
Bachelor's Degrees in Mechanical, Electrical and Industrial Engineering.....	6
Master's Degree in Industrial Engineering.....	6
Master's Degree in Telecommunications Engineering	6
Bachelor's Degree in Mechanical Design Engineering (Tudela Campus)	7
Internships at local companies	8
Full Semesters	9
Renewable Energy International Project Semester	9
Pamplona Campus - Spring (Starting Spring 2023)	9
Semester in Electronic Engineering – Pamplona Campus - Spring	9
Study Abroad Programs	10

Courses Taught in English

Bachelor's Degrees in Mechanical, Electrical and Industrial Engineering

Code	Name	Semester	ECTS
252101	Mathematics I	Fall	6
252103	Computer Science	Fall	6
252104	Engineering Graphics	Fall	6
252105	Fundamentals of Physics	Fall	6
252106	Business	Fall	6
252201	Statistics	Spring	6
252203	Chemistry	Spring	6
252204	Further Studies in Physics	Spring	6
252205	Industrial Drawing	Spring	6
252206	Mathematics II	Spring	6
252301	Mathematics III	Fall	6
252302	Electric Circuits	Fall	6
252303	Materials Science	Fall	6
252305	Thermodynamics	Fall	6
252401	Electric Machines	Spring	6
252402	Mechanics	Spring	6
252403	Control Systems I	Spring	6
252404	Elasticity and Strength of Materials I	Spring	6
252405	Fundamentals of Electronics	Spring	6
252502	Advanced Physics	Fall	3
252503	Materials Technology	Fall	3
252504	Machines Theory	Fall	6
252506	Industrial Electronics	Fall	6
252601	Heat Transfer	Spring	3
252602	Numerical Methods	Spring	3
252606	Design and Testing of Machines	Spring	6
252614	Control Systems II	Spring	6
252702	Environmental Technology	Fall	3
252704	Thermal Engineering	Fall	6
252711	Wind and Photovoltaic Systems	Fall	6
252890	Bachelor's Thesis	Fall/Spring	12

Bachelor's Degree in Design Engineering (Tudela Campus)

Code	Name	Semester	ECTS
251304	Theory of Machines	Fall	6
251890	Bachelor's Thesis	Fall/Spring	12

Bachelor's Degree in Telecommunications Engineering

Code	Name	Semester	ECTS
253101	Mathematics I	Fall	6
253103	Computer Science	Fall	6
253105	Introduction to Engineering and Project Management	Fall	6
253106	Business	Fall	6
253201	Statistics	Spring	6
253205	Digital Systems I	Spring	6
253206	Mathematics II	Spring	6
253207	Fundamentals Of Electronics	Spring	6
253302	Electronic Circuits	Fall	6
253404	Digital Communications	Spring	6
253501	Fundamentals of Wired Networks	Fall	6
253502	Fundamentals of Wireless Networks	Fall	6
253504	Interactive Digital Television	Fall	6
253505	Design and Test of Electronic Systems	Fall	6
253890	Bachelor's Thesis	Fall/Spring	18

Bachelor's Degree in Computer Science

Code	Name	Semester	ECTS
250101	Mathematics I	Fall	6
250103	Computer Science	Fall	6
250106	Business	Fall	6
250201	Statistics	Spring	6
250206	Mathematics II	Spring	6
250207	Fundamentals of Electronics	Spring	6
250401	Advanced Programming	Spring	6
250503	Network Architecture	Fall	6
250602	Software Architecture	Spring	6
250603	Computation	Spring	6
250890	Bachelor's Thesis	Fall/Spring	12

Master's Degree in Industrial Engineering

Code	Name	Semester	ECTS
720203	Thermal and Fluid Engineering	Fall	4.5
720208	Industrial Optimization	Fall	3
720290	Master's Thesis	Fall/Spring	30

Online Courses

Code	Name	Semester	ECTS
	Ecodesign by Life Cycle Assessment	Spring	3
	Green Logistics for Smart Cities	Fall/Spring	6

English Friendly Courses

The English Friendly Catalogue has been designed to help incoming students who have not reached yet full linguistic competence in Spanish to complete an attractive curriculum during their exchange program. Courses belonging to this category fulfil the following requirements:

- Lectures are delivered in Spanish. Mobility students taking them must have basic skills in this language.
- All learning materials (slides, class notes, exercises, books...) are available in English.
- Office hours are conducted in English, if the student requests so.
- Similarly, students have the right to be assessed in English.

Bachelor's Degrees in Mechanical, Electrical and Industrial Engineering

Code	Name	Semester	ECTS
252612	Digital Systems	Spring	6
252706	Theory of Structures	Fall	3
252708	Industrial Electrical Installation	Fall	6
252811	Electrical Drives II	Spring	6
252814	Design and Testing of Electronic Devices	Spring	6
252815	Industrial and Building Automation Systems	Spring	6
252821	Statistical Quality Control	Spring	3
252823	Operations Research	Spring	3

Master's Degree in Industrial Engineering

Code	Name	Semester	ECTS
720205	Automation and Process Control	Fall	4.5
720246	Marketing	Fall	4.5
720247	Simulation for Decision Making	Fall	4.5
720250	Advanced Optimization	Fall	3

Master's Degree in Telecommunications Engineering

Code	Name	Semester	ECTS
73066	Integrated Embedded Systems	Spring	6
73084	Antennas and Radio Propagation Technologies	Fall	6

Bachelor's Degree in Mechanical Design Engineering (Tudela Campus)

Code	Name	Semester	ECTS
251102	Fundamentals of physics	Fall	6
251303	Electrical engineering	Fall	6
251504	Thermal machines	Fall	6
251505	Hydraulic machines	Fall	6
251705	Polymeric materials	Fall	3
251706	Ceramic materials	Fall	3
251203	Further studies in physics	Spring	6
251205	Statistics	Spring	6
251404	Operations management	Spring	6
251602	Machine calculation, testing and design	Spring	6
251603	Manufacturing engineering	Spring	6
251802	Ecodesign	Spring	6
251803	Computer assisted engineering	Spring	6

Internships at local companies

Exchange students interested in an internship at a local company in Navarre can benefit from UPNA's Traineeship Program. Run by the UPNA's Foundation, this program allows hundreds of students every year to spend a semester getting trained in a member of UPNA's large list of industrial partners. During that time, they carry out their Bachelor's Thesis or their Master's thesis under the supervision of an UPNA professor.

Exchange students accepted in the program must enrol in two UPNA's courses: "Bachelor's/Master's Thesis" and "Internship Training". They will be graded in each one of them by an evaluation committee after an oral presentation of their work.

For further details, please visit the School of Industrial & ICT Engineering [Webpage](#) or contact inigo.delaparra@unavarra.es

Full Semesters

Renewable Energy International Project Semester Pamplona Campus - Spring (Starting Spring 2023)	
Renewable Energy Seminars: the main concepts about solar energy, wind energy, solar thermoelectric energy, geothermal energy, HVAC, storage systems and sustainability will be developed in this module.	3 ECTS, in English
Project Management: the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements will be taught in this course.	3 ECTS, in English
Spanish as a Foreign Language: This course aims at developing the foreign students' language skills and their cultural competence in Spanish.	6 ECTS, in Spanish
Bachelor's Thesis: The thesis work is a technological task related to renewable energies sources to be done in a lab at UPNA together with other international and local students.	18 ECTS, in English

Semester in Electronic Engineering – Pamplona Campus - Spring	
Control Systems II: Building upon the foundations laid in “Automatic Control”, this subject shows how to design and implement a controller using a computer or a microcontroller.	6 ECTS, in English
Digital Systems: Unveiling the logic and architecture of program memory based digital systems. Low and high level language programming and project based learning using Microchip® PIC® microcontrollers, sensors and actuators.	6 ECTS, English Friendly
Design & Testing of Electronic Systems: Printed circuit board (PCB) design principles for digital, analog and power electronics using CAD software and experimental projects assembly.	6 ECTS, English Friendly
Industrial and Building Automation Systems: Aspects, devices and topological possibilities of home and building automatic systems (HBAS). Experimental and theoretical study of some commercial HBAS. Industrial control systems technology.	6 ECTS, English Friendly
Power Electronic Converters: This course deals with the main aspects of power electronics, including semiconductors, drives, cooling, sizing capacitors and inductors and design of the control loops, for the main structures of conversion: DC/DC, DC/AC, AC/DC and AC/AC. Finally, the main current applications are reviewed.	6 ECTS, English Friendly

Study Abroad Programs

The School of Engineering at UPNA offers several Study Abroad programs for partner universities interested in short-term exchanges (2 to 4 weeks) of medium-large groups of students and professors. Usually scheduled during the spring and summer breaks, these programs are complemented with an introductory course to Spanish Language and Culture and visits to local companies and tourist landmarks. One of the most demanded study abroad program is the following:

Course Title: Sustainable Energy and Spanish culture

Location: Pamplona, Spain

Dates: 4 weeks TBC

Instructors: The course will be taught by instructors from UPNA (Public University of Navarre – Pamplona Campus) in Pamplona, Spain.

Course Language: Spanish & English

Program Overview:

Students will actively participate within a Spanish environment, whereby they will be exposed to and learn about its culture and traditions. On the one hand, the course offers an opportunity to know first-hand the main production techniques of electrical and thermal energy using renewable energies and, on the other hand, it also focus on socio-cultural aspects of Spanish and provides students with an overview on both the language and culture.

Grading:

Students will be graded on the basis of these pre-travel assignments, active class participation and engagement in group discussion, other in-class activities and a post-departure project that will involve carrying out further research on an area of Spanish culture that aroused their interest in particular. Grading will be calculated as follows:

- Participation (20%) – students will be graded for participation based on attendance at both classroom-based meetings and organized activities outside of class.
- Informal Written Assignments (25%) – completed both prior to travel as well as while in Spain. Students will prepare written responses to a variety of questions in preparation for upcoming excursions as well as reflections of completed excursions. Assignments will be graded based on both writing quality and thoroughness.
- Post-Departure Project (25%) – due four weeks after program is complete.
- Exams (30%) – given in weeks two and four of program

Module 1: Sustainable Energy I – 3 ECTS

In-class teaching hours: 15

Language activities (outdoor activities): 15

Student coursework: 45

Contents:

1. Biomass for electrical energy production.
2. Geothermal energy for electrical energy production.
3. Solar energy for thermal energy production with solar collectors.
4. Energy storage technology

Activities:

1. Visit to the historical part (city walls) and “pintxos”.
2. Visit to a company. TBC depending on the evolution of COVID-19.
3. Day trip to San Sebastian + surfing course.
4. Seeing and doing at the city

Module 2: Sustainable Energy II – 3 ECTS

In-class teaching hours: 15

Language activities (outdoor activities): 15

Student coursework: 45

Contents:

1. Electric Mobility.
2. Microgrids.
3. The goal of a 100% renewable energy system.
4. Final Exam + Course conclusions.

Activities:

1. Traditional Spanish culinary workshop
2. Visit to a company. TBC depending on the evolution of COVID-19.
3. Day Trip to Olite Castle – Palace
4. Seeing and doing at the city

Module 3: Spanish Culture I - 3 ECTS

In-class teaching hours: 8

Language activities (outdoor activities): 22

Student coursework: 45

Contents:

Spain through Media and Popular Culture:

As an ice-breaker to the course it would be interesting for students to share what they already know about Spain. It will be requested of them to write a short paper on the impression they have of Spain and on what they consider to be typically 'Spanish', and why. This exercise may be based on press articles, television, advertising, cinema or music and will enable us to investigate how stereotypes are formed or deconstructed through the media and the arts.

History:

This section aims at providing students with an understanding of the broad sweep of Spanish history including its earliest settlers, the history of peoples in the Iberian Peninsula from the Middle Ages, through the establishment and unification of kingdoms, to the formation of a constitutional monarchy, to the establishment of a democratic constitution. An overview of key moments of Spanish history will be used to provide an understanding of their impact on Spanish thought and society.

Geography:

Spain is located on the western end of Europe on the Iberian Peninsula. We will look at how the region is currently divided, study some demographic facts and figures (population, employment) and become acquainted with its main towns and most visited tourist attractions, which will lead us to examine some key economic data and major industries.

Activities:

1. Visit to a company. TBC depending on the evolution of COVID-19.
2. Cathedral of Pamplona and Museum of Navarra
3. Day trip to Roncesvalles and Stage of Saint James Way
4. Seeing and doing at the city

Module 4: Spanish Culture II - 3 ECTS

In-class teaching hours: 8

Language activities (outdoor activities): 22

Student coursework: 45

Contents:

Language:

The evolution of the Spanish language and the events that have influenced its development will be discussed. This will lead us to consider the role of the Spanish language in cultural realms today.

Cuisine:

As a high priority is placed on the enjoyment of food in Spanish culture, a brief study of key elements in Spanish culinary tradition will be the aim of this section. We will focus on both regional and national Spanish specialties and traditions.

Art & Design:

The aim here is to introduce students to the most representative elements of Spanish art and design. A study of some examples of art through the history of Spain, and how Spanish culture is reflected and portrayed. In addition, Spanish architecture and its distinct characteristics will be examined. We may also take a closer look at other monuments in Spain and the symbolism of the Spanish flag.

Music and Traditional Activities:

Although Spaniards are taking an active role in the transmission of a unique heritage in the domain of traditional music and dance from one generation to the next, it has not prevented them from creating new performance contexts or composing new music. In addition, other Spanish traditional such as Pamplona's running of the bulls will be discussed. Students will discover some of the most popular Spanish musicians and activities. The final objective is to help them identify the Spanish cultural spirit in a broad sense.

Activities:

1. Final Weekend: Sights and Sounds of Madrid
2. Visit to a company. TBC depending on the evolution of COVID-19.
3. Seeing and doing at the city

APROXIMATE COURSE SCHEDULE

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		WEEK 1							WEEK 2							WEEK 3							WEEK 4						
		L	M	X	J	V	S	D	L	M	X	J	V	S	D	L	M	X	J	V	S	D	L	M	X	J	V	S	D
Total hours																													
M1. Sustainable Energy I																													
In-class teaching hours	15	2	2	2	2				2	2	2	1																	
Activities	15	2		2		4			2		2		3																
Student coursework	45																												
	75																												
M2. Sustainable Energy II																													
In-class teaching hours	15															2	2	2	2										
Activities	15															2		2		4									
Student coursework	45																												
	75																												
M3. Spanish Culture I																													
In-class teaching hours	8		2		2					2		2																	
Cultural activities	22		2		2	4				2		2	4				2		2					2					
Student coursework	45																												
	75																												
M4. Spanish Culture II																													
In-class teaching hours	8																2		2					2		2			
Cultural activities	22																			4				2					
Student coursework	45																												
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300		4	6	4	6	8	0	0	4	6	4	5	7	0	0	4	6	4	6	8	0	0	6	6	4	6	0	8	8